

IN THE CLAIMS

Please amend the claims as follows:

1 1 (Currently Amended). A microcavity structure comprising two or more microcavity
2 waveguides, wherein one or more microcavity active regions are created by the overlap
3 of said microcavity waveguides and said two or more microcavity waveguides comprise
4 means for electrical activation.

1 2 (Original). The microcavity structure of claim 1, wherein said microcavity overlap is
2 defined by crossing of at least two of the said microcavity waveguide at an angle.

1 3 (Original). The microcavity structure of claim 1, wherein each waveguide includes at
2 least two optical reflectors.

1 4 (Original). The microcavity structure of claim 3 wherein the optical reflector
2 component comprises of a variation in material refractive index in order to change the
3 direction of the incident optical energy.

1 5 (Original). The microcavity structure of claim 4 wherein the optical reflector could be,
2 but is not restricted to, a structure with a periodic change in the refractive index such as a
3 photonic crystal.

1 6 (Original). The microcavity structure of claim 3, wherein the optical reflectors surround
2 the active microcavity regions.

1 7 (Original). The microcavity structure of claim 3, wherein one or more of the optical
2 reflectors are less reflective to define one or more output paths of the generated light.

1 8 (Original). A microcavity structure of claim 1, wherein the microcavity waveguides
2 provide means for material continuity to achieve the conduction of current to the active
3 microcavity overlap regions.

1 9. (Cancelled).

1 10 (Currently Amended). The microcavity structure of claim ~~[[9]]~~ 1 further comprising
2 at least one contact pad that is coupled to each of the microcavity waveguides so as to
3 apply voltage across said microcavity structures.

1 11 (Original). The microcavity structure of claim 10, wherein the top waveguide
2 comprises p-doped material and the bottom waveguide comprises n-doped material.

1 12 (Original). The microcavity structure of claim 10, wherein the top waveguide
2 comprises n-doped material and the bottom waveguide comprises p-doped material.

1 13 (Original). The microcavity structure of claim 1 further comprising a mechanism to
2 provide carrier confinement in the active overlap regions by converting the material
3 under portion of the upper waveguide into an insulator.

1 14 (Original). The microcavity structure of claim 1, wherein at least one of the
2 microcavity waveguides comprises active material used in the generation of photons.

1 15 (Original). A microcavity structure in claim 1, wherein the active material is
2 composed of quantum wells and/or quantum dots.

1 16 (Original). The microcavity structure of claim 1, wherein at least one of said
2 microcavity waveguides is used to guide light.

1 17 (Currently Amended). A method of forming a microcavity structure comprising:
2 providing two or more microcavity waveguides; and
3 forming one or more microcavity active regions by overlapping said microcavity
4 waveguides and said two or more microcavity waveguides comprise means for electrical
5 activation.

1 18 (Original). The method of claim 17, wherein said microcavity overlap is defined by
2 crossing of at least two of the said microcavity waveguide at an angle.

1 19 (Original). The method of claim 17, wherein each waveguide includes at least two
2 optical reflectors.

1 20 (Original). The method of claim 19, wherein the optical reflector component
2 comprises of a variation in material refractive index in order to change the direction of
3 the incident optical energy.

1 21 (Original). The method of claim 20, wherein the optical reflector could be, but is not
2 restricted to, a structure with a periodic change in the refractive index such as a photonic
3 crystal.

1 22 (Original). The method of claim 19, wherein the optical reflectors surrounds the active
2 microcavity regions.

1 23 (Original). The method of claim 19, wherein one or more of the optical reflectors are
2 less reflective to define one or more output path of the generated light.

1 24 (Original). A method of claim 17, wherein the microcavity waveguides provide means
2 for material continuity to achieve the conduction of current to the active microcavity
3 overlap regions.

1 25. (Cancelled)

1 26 (Currently Amended). The method of claim ~~[[25]]~~ 17 further comprising providing at
2 least one contact pad that is coupled to each of the microcavity waveguides so as to apply
3 voltage across said microcavity structures.

1 27 (Currently Amended). The method of claim ~~[[25]]~~ 17, wherein the top waveguide
2 comprises p-doped material and said bottom waveguide comprises n-doped material.

1 28 (Currently Amended). The method of claim ~~[[25]]~~ 17, wherein the top waveguide
2 comprises n-doped material and the bottom waveguide comprises p-doped material.

1 29 (Original). The method of claim 17 further comprising providing a mechanism to
2 provide carrier confinement in the active regions by converting the material under portion
3 of the upper waveguide into an insulator.

1 30 (Original). The microcavity structure of claim 17, wherein at least one of said first
2 and second waveguides comprises active material used in the generation of photons.

1 31 (Original). A microcavity structure in claim 17, wherein the active material is
2 composed of quantum wells and/or quantum dots.

1 32 (Original). The microcavity structure of claim 17, wherein at least one of said first
2 and second waveguides is used to guide light.

1 33 (Currently Amended). A microcavity structure comprising:
2 a first waveguide including a first photonic crystal microcavity; and
3 a second waveguide including a second photonic crystal microcavity; and
4 a microcavity active region that is created by overlapping said first and second
5 microcavities;
6 wherein said first waveguide and second waveguide comprise means for electrical
7 activation.

1 34 (Original). The microcavity of claim 33, wherein the photonic crystal surrounds the
2 active microcavity region.

1 35 (Original). The microcavity structure of claim 33, wherein one or more of the photonic
2 crystals are less reflective to define a single or multiple output path of the generated light.

1 36 (Original). The microcavity structure of claim 33, wherein the first and second
2 waveguides provide means for material continuity to achieve the conduction of current to
3 the active microcavity overlap region.

1 37. (Cancelled)

1 38 (Currently Amended). The microcavity structure of claim ~~[[37]]~~ 33 further
2 comprising at least one contact pad that is coupled to said first waveguide and at least one
3 contact pad that is coupled to said second waveguide so as to apply voltage across said
4 microcavity structure.

1 39 (Currently Amended). The microcavity structure of claim ~~[[37]]~~ 33, wherein said first
2 waveguide comprises p-doped material and said second waveguide comprises n-doped
3 material.

1 40 (Original). The microcavity structure of claim ~~[[37]]~~ 33, wherein said first waveguide
2 comprises n-doped material and said second waveguide comprises p-doped material.

1 41 (Original). The microcavity structure of claim 33 further comprising a mechanism to
2 provide carrier confinement to the active region by converting the material under portion
3 of the upper waveguide into an insulator.

1 42 (Original). The microcavity structure of claim 33, wherein at least one of said first
2 and second waveguides is used to guide light.

1 43 (Original). The microcavity structure of claim 33, wherein at least one of said first
2 and second waveguides comprises active material used in the generation of photons.

1 44 (Original). The microcavity structure of claim 43, wherein said active material
2 comprises quantum wells and/or quantum dots.

1 45 (Original). The microcavity structure of claim 42, wherein said first waveguide
2 guides generated light and said second waveguide comprises active material used in the
3 generation of photons.

1 46 (Original). The microcavity structure of claim 45, wherein said active material
2 comprises quantum wells and/or quantum dots.

1 47 (Original). The microcavity structure of claim 45, wherein said first waveguide
2 comprises p-doped material and said second waveguide comprises n-doped material.

1 48 (Original). The microcavity structure of claim 45, wherein said first waveguide
2 comprises n-doped material said second waveguide comprises p-doped material.

1 49 (Original). The microcavity structure of claim 42, wherein said second waveguide
2 guides generated light and said first waveguide comprises active material used in the
3 generation of photons.

1 50 (Original). The microcavity structure of claim 49, wherein said active material
2 comprises quantum wells and/or quantum dots.

1 51 (Original). The microcavity structure of claim 49, wherein said first waveguide
2 comprises p-doped material and said second waveguide comprises n-doped material.

1 52 (Original). The microcavity structure of claim 49, wherein said first waveguide
2 comprises n-doped material said second waveguide comprises p-doped material.

1 53 (Currently Amended). A method of forming a microcavity structure comprising:
2 forming a first waveguide including a first photonic crystal microcavity; and
3 forming a second waveguide including a second photonic crystal microcavity; and
4 forming a microcavity active region that is created by overlapping said first layer
5 and second microcavities, wherein said first waveguide and second waveguide comprise
6 means for electrical activation.

1 54 (Original). The method of claim 53, wherein the photonic crystal surrounds the active
2 microcavity region.

1 55 (Original). The method of claim 53, wherein one or more of the photonic crystals are
2 less reflective to define a single or multiple output path of the generated light.

1 56 (Original). The method of claim 53, wherein the first and second waveguides provide
2 means for material continuity to achieve the conduction of current to the active
3 microcavity overlap region.

1 57. (Cancelled)

1 58 (Currently Amended). The method of claim ~~[[57]]~~ 53 further comprising at least one
2 contact pad that is coupled to said first waveguide and at least one contact pad that is
3 coupled to said second waveguide so as to apply voltage across said microcavity
4 structure.

1 59 (Currently Amended). The method of claim ~~[[57]]~~ 53, wherein said first waveguide
2 comprises p-doped material and said second waveguide comprises n-doped material.

1 60 (Currently Amended). The method of claim ~~[[57]]~~ 53, wherein said first waveguide
2 comprises n-doped material and said second waveguide comprises p-doped material.

1 61 (Original). The method of claim 53 further comprising a mechanism to provide carrier
2 confinement to the active region by converting the material under portion of the upper
3 waveguide into an insulator.

1 62 (Original). The method of claim 53, wherein at least one of said first and second
2 waveguides is used to guide light.

1 63 (Original). The microcavity structure of claim 53, wherein at least one of said first
2 and second waveguides comprises active material used in the generation of photons.

1 64 (Original). The microcavity structure of claim 63, wherein said active material
2 comprises quantum wells and/or quantum dots.

1 65 (Original). The microcavity structure of claim 62, wherein said first waveguide
2 guides generated light and said second waveguide comprises active material used in the
3 generation of photons.

1 66 (Original). The method of claim 65, wherein said active material comprises quantum
2 wells and/or quantum dots.

1 67 (Original). The method of claim 65, wherein said first waveguide comprises p-doped
2 material and said second waveguide comprises n-doped material.

1 68 (Original). The method of claim 65, wherein said first waveguide comprises n-doped
2 material said second waveguide comprises p-doped material.

1 69 (Original). The method of claim 62, wherein said second waveguide guides generated
2 light and said first waveguide comprises active material used in the generation of
3 photons.

1 70 (Original). The method of claim 69, wherein said active material comprises quantum
2 wells and/or quantum dots.

1 71 (Original). The method of claim 69, wherein said first waveguide comprises p-doped
2 material and said second waveguide comprises n-doped material.

1 72 (Original). The method of claim 69, wherein said first waveguide comprises n-doped
2 material said second waveguide comprises p-doped material.